

General notes

Load capacity and working life

Installation site

In principal, the installation site for linear guides can be chosen anywhere. You merely have to consider whether all the forces and moments arising are below the maximum values for the relevant axes.

Temperatures

All linear guides are designed for continuous operation at ambient temperatures of up to 60 °C. In short-term operation, maximum temperatures of 80 °C are permissible.

Linear guides are unsuitable for temperatures below freezing.

Straightness/Warping

The aluminium profiles used are extruded profiles, which exhibit divergences regarding straightness and may be warped, owing to the manufacturing process.

The tolerance of this deviation is set out in DIN EN 12020-2.

In the worst case, the linear guide deviations equal these limits, but typically they are lower.

In order to achieve the desired guidance accuracy, the guide must be aligned using shims or clamped to a bearing service machined to the corresponding accuracy. This achieves tolerances of at least 0.1 mm/1000 mm.

Principles

Load capacity and working life

The dimensioning of a linear guide is based on the load capacity of the individual elements. The load capacity is described by:

- the dynamic load factor C
- the static load factor C0
- the static torques MOX, MOY and MOZ

The basis of the dynamic load factors according to DIN is a nominal working life of 100,000 m displacement path. Far East suppliers often quote load factors for a nominal working life of 50,000 m displacement path; this produces load factor figures which are approximately 20% higher than those according to DIN.

Dynamic load capacity

The fatigue characteristics of the material determine the dynamic load capacity. The working life - the fatigue period - also depends on:

- the stress on the linear guide
- the speed at which the linear guide moves
- the statistical randomness of the first damage occurring

Useful life

Useful life means the working life actually achieved by a linear guide. The useful life may differ from the computed working life.

The following can lead to premature failure through wear or fatigue:

- Misalignments between guide rails or guidance elements
- Contamination of the guide rails
- Insufficient lubrication
- Oscillating motion with very small lifts (formation of grooves)
- Vibrations at rest (formation of grooves)

Owing to the multiplicity of installation and operating relationships, it is impossible to determine the useful life of a linear guide exactly in advance. The safest way to make an accurate estimate of the useful life is, as before, a comparison with similar installations.